

What is claimed is:

1. A reinforced panel structure comprising a first panel comprising a first planar surface and a nonplanar boss, a second panel comprising a second planar surface and defining an opening, the second panel opening receivingly engaging the first panel boss permitting contiguous mating contact of the first and second planar surfaces.

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2. The structure of claim 1 wherein the first panel defines an opening and  
10 the second panel comprises a nonplanar boss, the first panel opening receivingly  
engaging the second panel boss.

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3. The structure of claim 2 wherein the first and second panels comprise a plurality of bosses and openings.

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4. The structure of claim 3 wherein the first and second bosses are opposingly disposed.

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5. The structure of claim 3 wherein the first and second panel bosses are interleaved.

6. The structure of claim 5 wherein the first and second planar surfaces comprise two pair of opposing webs joined to define an enclosure with a central passage.

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7. The structure of claim 5 wherein the first and second planar surfaces comprise a first portion comprising a first medial web and substantially orthogonal flanges extending from a proximal and distal end thereof, and a second portion comprising a second medial web and substantially orthogonal flanges extending from a proximal and distal end thereof, the portions joined with the orthogonal flanges abuttingly engaged and the webs in substantial parallel mating relationship defining an enclosure with a central passage.

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8. A composite corrugated panel comprising a first corrugated panel defining a first corrugation height joined to a second corrugated panel defining a second corrugation height, the joined panels defining a cross sectional thickness that is less than a sum of the first and second corrugation heights.

9. The composite corrugated panel of claim 8 wherein the first and second corrugated panels comprise first and second corrugations, respectively, that are disposed in opposing directions.

10. The composite corrugated panel of claim 9 wherein the first and second corrugated panels comprise first and second openings, respectively, the first openings each receivably engaging one of the second corrugations and the second openings each receivably engaging one of the first corrugations.

11. The composite corrugated panel of claim 10 wherein the first and second corrugations are interleaved.

12. The composite corrugated panel of claim 11 wherein the first and second corrugated panels comprise two pair of opposing webs joined to define an enclosure with a central passage.

13. The composite corrugated panel of claim 11 wherein the first and second corrugated panels comprise a first portion comprising a first medial web and substantially orthogonal flanges extending from a proximal and distal end thereof, and a second portion comprising a second medial web and substantially orthogonal flanges extending from a proximal and distal end thereof, the portions joined with the orthogonal flanges abuttingly engaged and the webs in substantial parallel mating relationship defining an enclosure with a central passage.

14. A method for producing a composite corrugated panel, comprising:  
providing a first panel comprising a first corrugation and a first opening;  
providing a second panel comprising a second corrugation and a second  
opening;

5                   stacking the panels by disposing the first corrugation in the second opening  
                      and the second corrugation in the first opening.

15. The method of claim 14 wherein the stacking step comprises disposing  
the corrugations in opposing directions.

10                  16. The method of claim 15 wherein the providing a first panel comprises  
                      providing a first panel defining a selected first material thickness and first  
                      corrugation height, and the providing a second panel comprises providing a second  
                      panel defining a selected second material thickness and second corrugation height.

15                  17. The method of claim 16 comprising selectively modeling the thickness  
                      of the composite corrugated panel as a function of the first and second material  
                      thicknesses and the first and second corrugation heights.

20                  18. The method of claim 17 wherein the modeling step comprises:  
                      (a) determining whether the second material thickness is less than the first  
                          corrugation height minus the first material thickness; and  
                      (b) determining whether the first material thickness is less than the second  
                          corrugation height minus the second material thickness.

25                  19. The method of claim 18 wherein the modeling step comprises:  
                      (c) if step (a) is yes and step (b) is yes, then modeling the thickness of the  
                          composite corrugated panel as being substantially the first corrugation  
                          height minus the first material thickness plus the second corrugation  
                          height minus the second material thickness;

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- (d) if step (a) is yes and step (b) is no, then modeling the thickness of the composite corrugated panel as substantially being the first corrugation height;
- (e) if step (a ) is no and step (b) is yes, then modeling the thickness of the composite corrugated panel as substantially being the second corrugation height; and
- (f) if step (a) is no and step (b) is no, then modeling the thickness of the composite corrugated panel is substantially being the sum of the first and second material thicknesses.